

## CLAIMS

What is claimed is:

1. A method for deferring instantiation of one or more hidden interface elements in a rich Internet application (RIA) comprising:
  - responsive to beginning said RIA, generating a descriptor tree having a plurality of descriptor nodes, wherein each of said plurality of descriptor nodes describes a plurality of visible interface elements of said RIA visible at said beginning of said RIA;
  - creating one or more hidden descriptor nodes in said descriptor tree describing said one or more hidden interface elements responsive to a user navigating to said one or more hidden interface elements; and
  - rendering said plurality of visible interface elements and said one or more hidden interface elements using corresponding ones of:
    - said plurality of descriptor nodes; and
    - said one or more hidden descriptor nodes.
2. The method of claim 1 further comprising:
  - converting said plurality of descriptor nodes into a plurality of detail objects;
  - converting said one or more hidden descriptor nodes into one or more hidden detail objects, wherein said plurality of visible interface elements and said one or more hidden interface elements are rendered directly using said plurality of detail objects and said one or more hidden detail objects.
3. The method of claim 1 wherein each one of said plurality of descriptor nodes and said one or more hidden descriptor nodes contains a software method for generating each its child nodes.
4. The method of claim 1 further comprising:
  - downloading executable code representing said RIA to a computer of said user responsive to said beginning of said RIA, wherein said generating and said creating use said executable code.

5. The method of claim 2 further comprising:  
storing as a plurality of stored nodes each of:  
    said plurality of descriptor nodes;  
    said one or more hidden descriptor nodes;  
    said plurality of detail objects; and  
    said one or more hidden detail objects; and  
re-rendering each of said plurality of visible interface elements and said one or more hidden interface elements from said plurality of stored nodes.
6. The method of claim 1 wherein said one or more hidden descriptor nodes created has a navigational relationship with a particular one of said one or more hidden interface elements to which said user navigates.
7. The method of claim 6 wherein said navigational relationship comprises one or more of:  
    a direct link;  
    an ordinal relationship;  
    a statistical relationship; and  
    a positional relationship.
8. The method of claim 1 further comprising:  
    creating select ones of said one or more hidden descriptor nodes in said descriptor tree responsive to beginning said RIA.

9. A method for executing a rich Internet application (RIA) defined using procedural code and declarative code, said method comprising:

- creating a root application node of a descriptor tree, responsive to a user initiating said RIA;

- generating a plurality of descriptor nodes for said descriptor tree, wherein each of said plurality describes an interface element currently visible to said user on a currently visible pane of said RIA;

- responsive to said user navigating to a subsequent pane of said RIA, constructing a plurality of stacked descriptor nodes for said descriptor tree, wherein each of said plurality of stacked descriptor nodes describes said interface element invisible to said user on said currently visible pane of said RIA and associated with said subsequent pane; and

- creating a detail object from each one of:

- said plurality of descriptor nodes; and

- said plurality of stacked descriptor nodes; and

- rendering said interface element using a corresponding detail object.

10. The method of claim 9 wherein said generating comprises:

- generating one of said plurality of descriptor nodes for a container of said interface element invisible to said user on said currently visible pane of said RIA.

11. The method of claim 9 wherein said association between said subsequent pane and said plurality of stacked descriptor nodes comprises one of:

- a direct link;

- an ordinal relationship;

- a statistical relationship; and

- a positional relationship.

12. A computer program product having a computer readable medium with computer program logic recorded thereon for deferring instantiation of unseen ones of a plurality of stacked elements in a rich Internet application (RIA), said computer program product comprising:

responsive to starting said RIA, code for generating a descriptor tree having a plurality of descriptor nodes, wherein each of said plurality of descriptor nodes describes a plurality of visible interface elements of said RIA;

code for creating one or more stacked descriptor nodes in said descriptor tree describing said unseen ones of said plurality of stacked interface elements responsive to a user navigating to said unseen ones; and

code for rendering said plurality of visible interface elements and said unseen ones using corresponding ones of:

said plurality of descriptor nodes; and

said one or more stacked descriptor nodes.

13. The computer program product of claim 12 further comprising:  
code for converting said plurality of descriptor nodes into a plurality of detail objects;  
code for converting said one or more stacked descriptor nodes into one or more stacked detail objects, wherein said plurality of visible interface elements and said unseen ones are rendered directly using said plurality of detail objects and said one or more stacked detail objects.

14. The computer program product of claim 12 wherein each one of said plurality of descriptor nodes and said one or more stacked descriptor nodes contains a software method for generating each its child nodes.

15. The computer program product of claim 12 further comprising:  
code for downloading bytecode representing said RIA to a computer of said user responsive to said starting of said RIA, wherein said code for generating and said code for creating use said bytecode.

16. The computer program product of claim 13 further comprising:  
code for storing as a plurality of stored nodes each of:  
    said plurality of descriptor nodes;  
    said one or more stacked descriptor nodes;  
    said plurality of detail objects; and  
    said one or more stacked detail objects; and  
code for re-rendering each of said plurality of visible interface elements and said one or more stacked interface elements from said plurality of stored nodes.
17. The computer program product of claim 12 wherein said one or more stacked descriptor nodes created has a navigational relationship with a particular one of said one or more stacked interface elements to which said user navigates.
18. The computer program product of claim 17 wherein said navigational relationship comprises one or more of:  
    a direct link;  
    an ordinal relationship;  
    a statistical relationship; and  
    a positional relationship.
19. The computer program product of claim 12 further comprising:  
code for code for creating select ones of said one or more stacked descriptor nodes in said descriptor tree responsive to starting said RIA.

20. A system for deferring instantiation of a plurality of interface elements in a rich Internet application (RIA) comprising:

responsive to initially accessing said RIA, means for generating a descriptor tree having a plurality of descriptor nodes, wherein each of said plurality of descriptor nodes describes visible ones of said plurality of interface elements of said RIA;

means for creating a plurality of hidden descriptor nodes in said descriptor tree describing hidden ones of said plurality of interface elements responsive to a user navigating to said one or more of said hidden ones; and

means for rendering said plurality of interface elements using corresponding ones of:

said plurality of descriptor nodes; and

said plurality of hidden descriptor nodes.

21. The system of claim 20 further comprising:

means for converting said plurality of descriptor nodes into a plurality of detail objects;

means for converting said plurality of hidden descriptor nodes into a plurality of hidden detail objects, wherein said plurality of visible interface elements are rendered directly using said plurality of detail objects and said plurality of hidden detail objects.

22. The system of claim 20 wherein each one of said plurality of descriptor nodes and said plurality of hidden descriptor nodes contains a software method for generating each its child nodes.

23. The system of claim 20 further comprising:

means for downloading executable bytecode representing said RIA to a computer of said user responsive to said initially accessing of said RIA, wherein said means for generating and said means for creating use said executable bytecode.

24. The system of claim 21 further comprising:  
means for storing as a plurality of stored nodes each of:  
said plurality of descriptor nodes;  
said plurality of hidden descriptor nodes;  
said plurality of detail objects; and  
said plurality of hidden detail objects; and

means for re-rendering each of said plurality of interface elements from said plurality of stored nodes responsive to said user navigating to previously viewed ones of said plurality of interface elements.

25. The system of claim 20 wherein said plurality of hidden descriptor nodes created has a navigational relationship with a particular one of said hidden ones to which said user navigates.

26. The system of claim 25 wherein said navigational relationship comprises one or more of:  
a direct link;  
an ordinal relationship;  
a statistical relationship; and  
a positional relationship.

27. The system of claim 20 further comprising:  
means for creating select ones of said plurality of hidden descriptor nodes in said descriptor tree responsive to initially accessing said RIA.